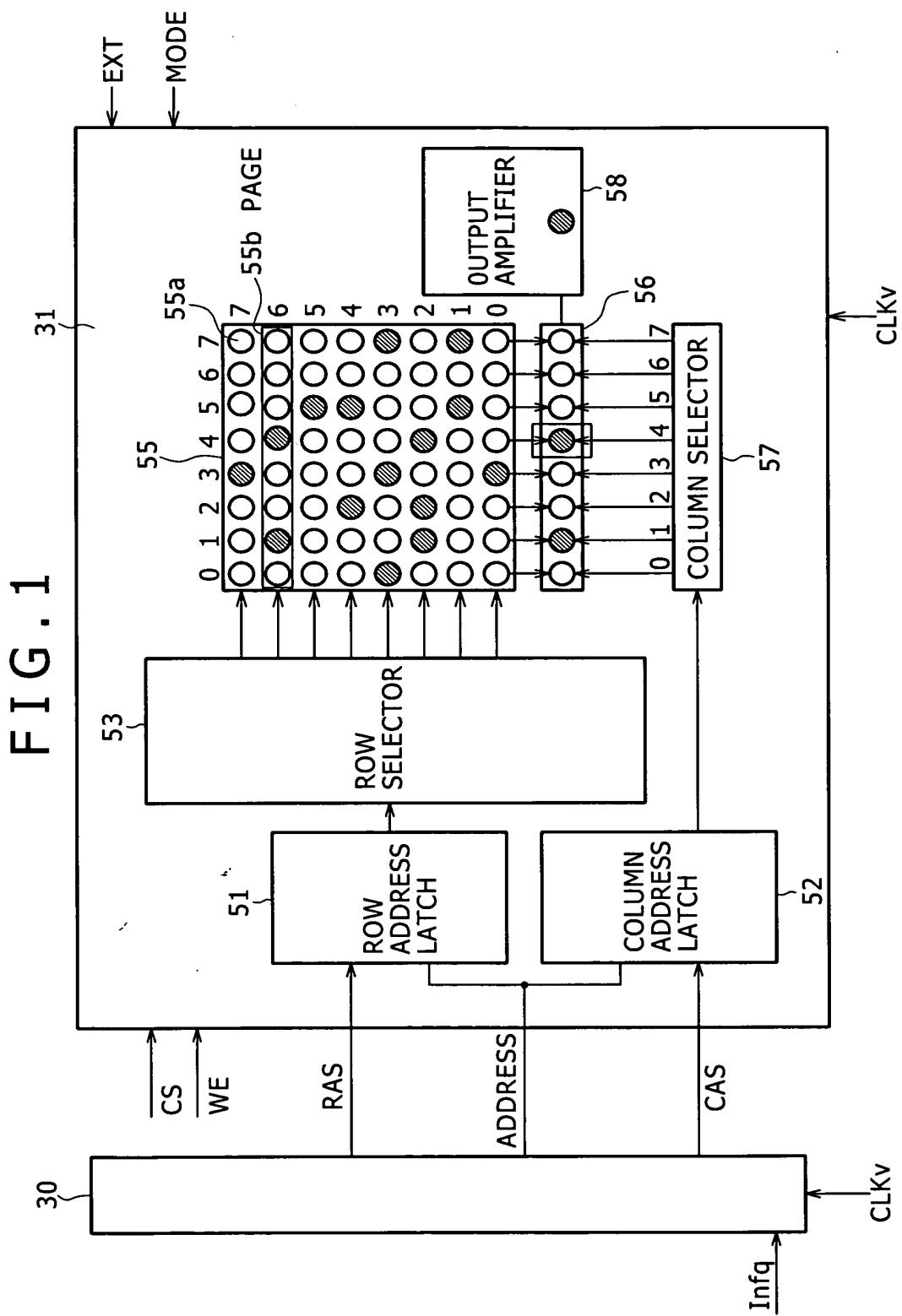


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FIG. 2

TYPICAL RELATIONSHIP BETWEEN SIGNALS AND COMMANDS

COMMAND OPERATION	CS	RAS	CAS	WE	EXT	MODE	ROW ADDRESS	COLUMN ADDRESS	BANK
DESL	H	X	X	X	X	X	X	X	X
NOP	H	H	H	H	H	H	X	X	X
NO-INSTRUCTION	L	H	L	H	X	X	X	X	X
READ	L	H	L	H	X	X	V	V	V
WRITE	L	H	L	H	X	X	V	V	V
ACT	L	L	L	H	X	X	V	V	V
PRE	L	H	L	H	X	X	V	V	V
PALL	L	L	L	H	X	X	V	V	V
REF	L	L	L	H	X	X	V	V	V
MRS	L	L	L	H	X	X	V	V	V
BST	L	L	L	H	X	X	V	V	V
P+A+R	L	H	L	H	X	X	V+	V+	V+
P+A+W	L	H	L	H	X	X	V+	V+	V+
A+R	L	H	L	H	X	X	V+	V+	V+
A+W	L	H	L	H	X	X	V+	V+	V+
EXTENDED COMPLEX OPERATIONS	[P+A+R P+A+W A+R A+W]	[L L L L]	[H H H H]	[X X X X]	[X X X X]	[X X X X]	[V V V V]	[V V V V]	[V V V V]

SYMBOL	MEANING
L	0
H	1
X	ARBITRARY
V	VALID (V+MAY REQUIRE TWO TIMES AMOUNT OF INFORMATION.)
*	PARTIALLY VALID

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FIG. 3 A

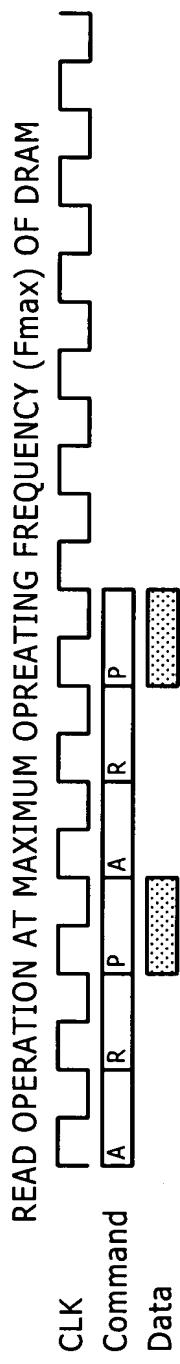


FIG. 3 B

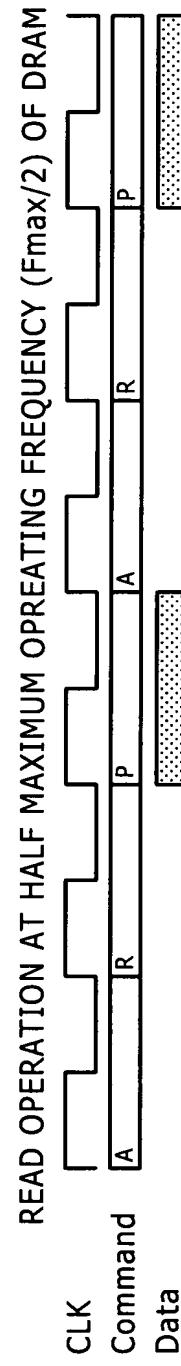
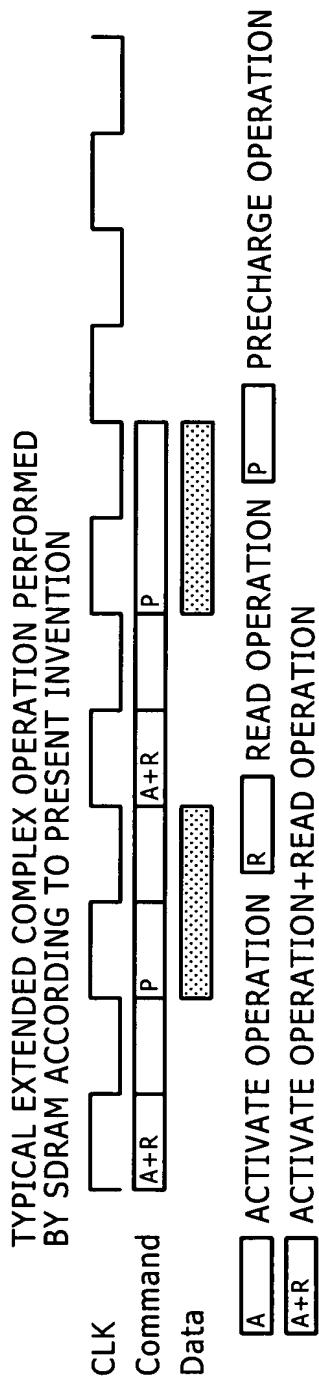


FIG. 3 C



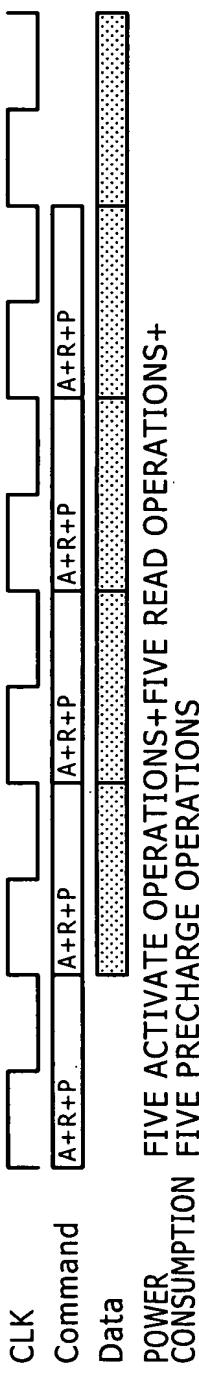
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FIG. 4 A

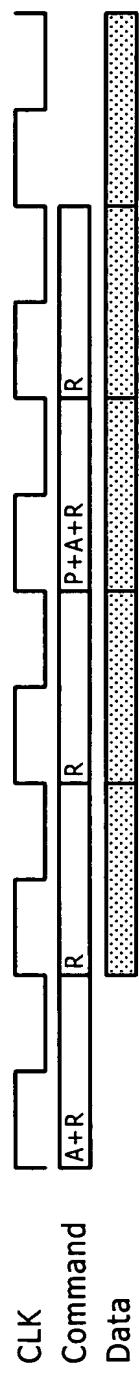
DRAM READ OPERATION FOR PERFORMING ACTIVATE+READ+PRECHARGE
OPERATION WITHIN ONE CLOCK



POWER CONSUMPTION FIVE ACTIVATE OPERATIONS+FIVE READ OPERATIONS+
FIVE PRECHARGE OPERATIONS

FIG. 4 B

TYPICAL EXTENDED COMPLEX OPERATION PERFORMED BY PRESENT INVENTION

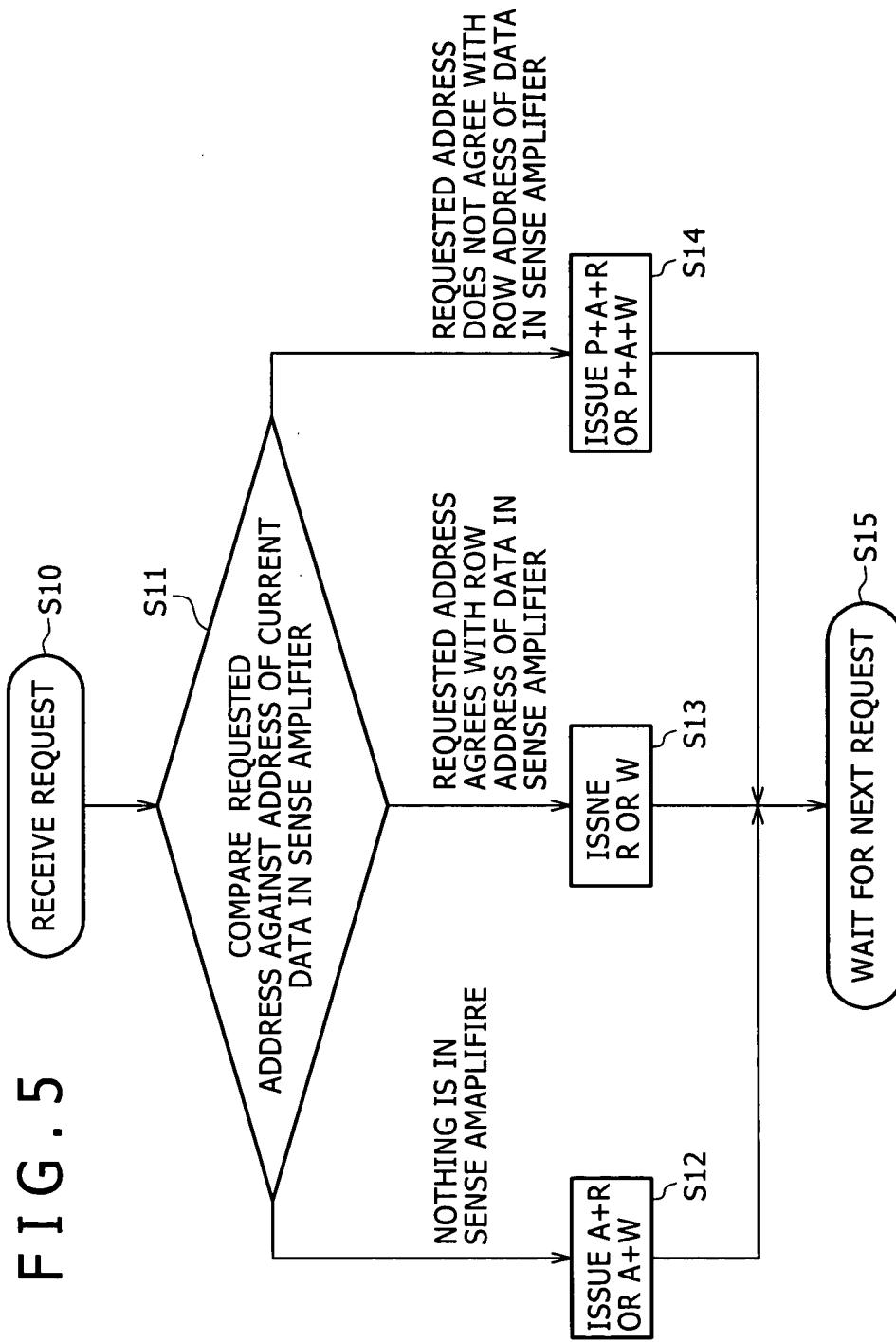


POWER CONSUMPTION TWO ACTIVATE OPERATIONS+FIVE READ OPERATIONS+
ONE PRECHARGE OPERATION

- [A+R+P] ACTIVATE OPERATION+READ OPERATION+PRECHARGE OPERATION
- [P+A+R] PRECHARGE OPERATION+ACTIVATE OPERATION+READ OPERATION
- [R] READ OPERATION
- [A+R] ACTIVATE OPERATION+READ OPERATION

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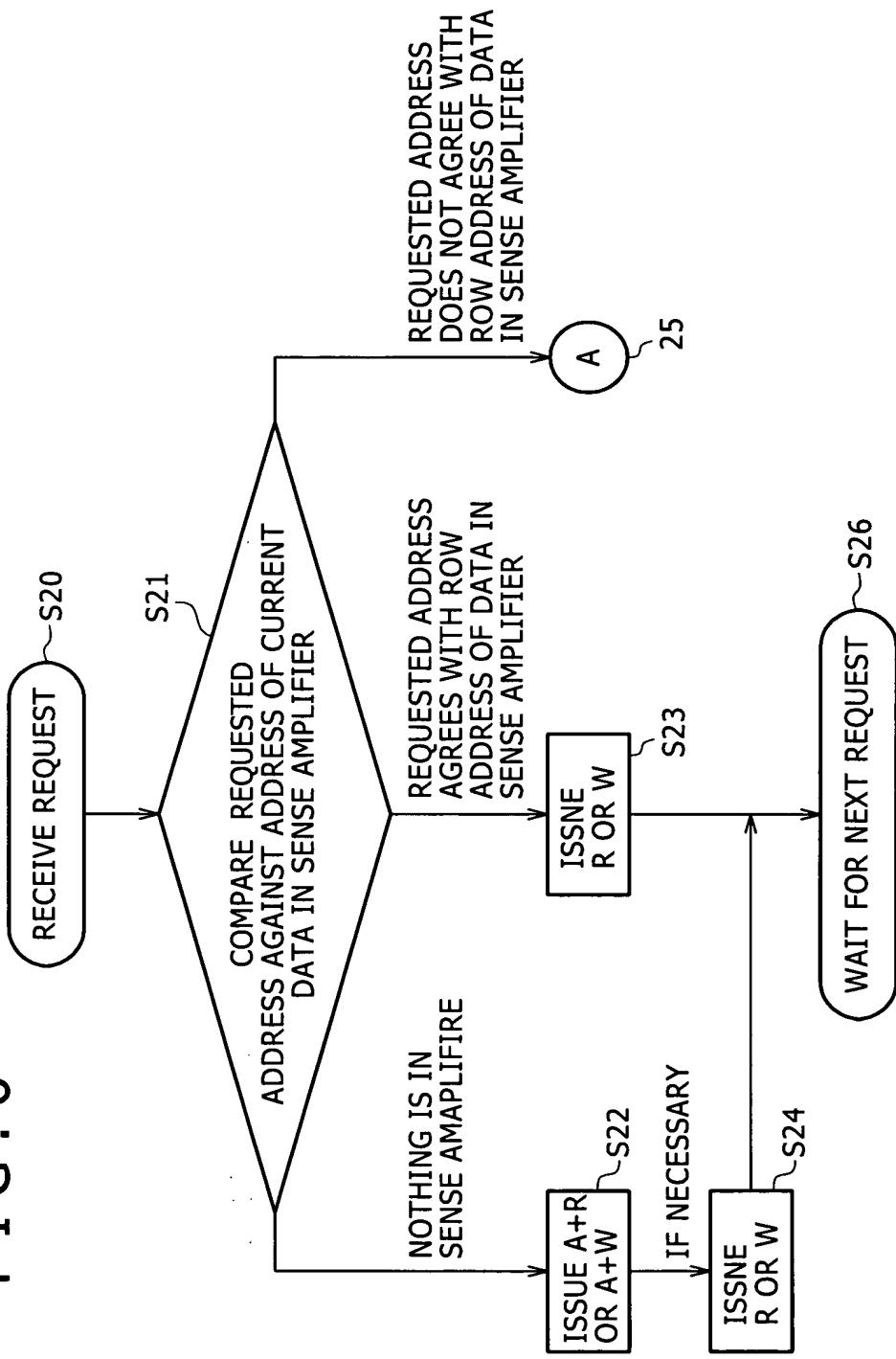


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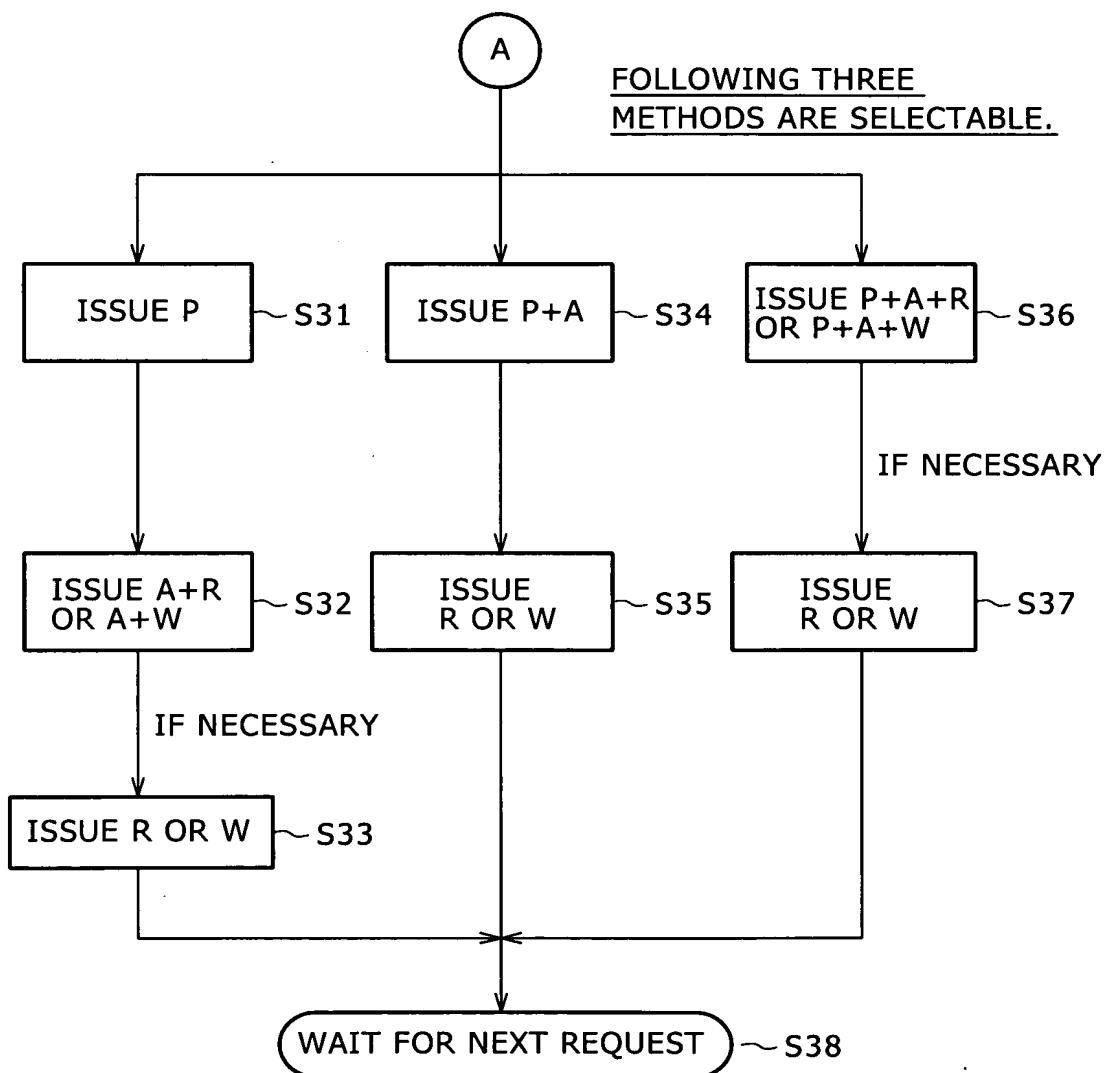
FIG. 6



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FIG. 8

